MEMORANDUM

Date: October 25, 2013

To: Jess Ward, District 1 Supervisor; Nabil Shafike, ISC Senior Hydrologist

From: Gary Stansifer, Middle Rio Grande Water Master

Subject: 2012 Accounting of ABCWUA Permits SP-4830, SP-4819, RG-960, RG-4462, and USR-2

The Albuquerque Bernalillo County Water Utility Authority (ABCWUA) diverted and applied water to beneficial use in the Rio Grande Underground Water Basin during 2012 via four State Engineer permits: OSE File Nos. 4830, 4819, RG-960 and RG-4462[1]. The ABCWUA is also permitted to operate an aquifer recharge demonstration project pursuant to State Engineer permit USR-2. This memorandum compiles and summarizes the required interrelated reporting and accounting for each permit.

Surface Permit 4830

The Albuquerque Bernalillo County Water Utility Authority (ABCWUA) reported a total diversion of 43,080acre-feet of surface water from the Rio Grande for its Drinking Water Project (DWP) under OSE File No. SP-4830 (see Table 1, Row 1). The conditions of approval for this permit state that the amount of native Rio Grande surface water diverted under this permit shall not exceed 50% of the total amount of water diverted.[2] During 2012, ABCWUA diversions were accounted as 27,556 acre-feet of San Juan-Chama (SJC) water (Table 1, Row 2) and 15,524 acre-feet of native Rio Grande water (Table 1, Row 3). No native Rio Grande water was diverted during the months of July and August of 2012. All of the native Rio Grande water was returned to the river simultaneously upon diversion.

All of the SJC water, 27,556 acre-feet, was diverted after release from storage in Abiquiu Reservoir and transport to the SW diversion using the loss rates required in the permit (Table 1, Row 5). To meet its demand, ABCWUA released 33,349 acre-feet of SJC water for subsequent diversion (Table 1, Row 6). Of that amount, 27,556 acre-feet was diverted and consumed and 1,661 acre-feet was counted as conveyance losses (Table 1, Row 7). This leaves a balance of 4,132 acre-feet of un-diverted DWP SJC releases (Table

[1] Permit RG-4462, formerly held in the name of New Mexico Utilities, Inc., was acquired by the ABCWUA on May 8, 2009.

[2] Daily coordination between the ABCWUA, the U.S. Bureau of Reclamation (BOR) and the OSE on DWP and reservoir operations occurs in order for the ABCWUA to meet this permit condition and to ensure that no more than twice the amount of SJC water reaching the DWP point of diversion is diverted. BOR's involvement is necessary because of their role in reservoir operations and oversight of the Upper Rio Grande Water Operations Model which accounts and tracks all SJC water entering the middle Rio Grande basin in accordance with the provisions of the Rio Grande Compact.

1, Row 8). ABCWUA and OSE have agreed to cap the over-release amount available for offset at 3,000 acre-feet per year, the permited amount for SP-4819.

Surface Permit 4819

ABCWUA reported a total diversion of 2,866 acre-feet of surface water from the Rio Grande for Non-Potable Surface Water Reclamation Project (Table 1, Row 11) under OSE File No. SP-4819. This entire amount must be offset by the release of SJC water. A total of 2,866 acre-feet was offset by the over-release of ABCWUA SJC water from Abiquiu Reservoir under SP-4830, which was not diverted by the DWP (Table 1, Row 12). Therefore, no additional offsets are required under SP-4819 (Table 1, Row 13).

RG-4462

ABCWUA reported diversions of 3,917 acre-feet for its RG-4462 wells for 2012 (Table 1, Row 15). Ongoing and residual stream depletion on the Rio Grande stream system in 2012 as a result of the groundwater pumping under OSE File No. RG-4462 totaled 4,148 acre-feet (Attachment C; Table 1, Row 16). ABCWUA has 1,261 acre-feet of acquired water rights available for offset of RG-4462 Rio Grande stream depletions (Table 1, Row 17). The portion of ABCWUA's total return flow attributed to exercise of RG-4462 in 2012 is 2,887 acre-feet (Table 1, Row 18). As a results, the total offset available for RG-4462 is 4,148 acre feet (1261 + 2887 acre feet), which is equal to the 2012 depletion of 4,148 acre-feet. Therefore, there is no balance requiring offset under RG-4462 (Table 1, Row 19).

RG-960

ABCWUA reported a total diversion of 55,593 acre-feet of ground water under OSE File No. RG-960 (Table 1, Row 20), based on reported meter readings for each individual RG-960 well. Ongoing and residual stream depletion on the Rio Grande stream system in 2012 as a result of the groundwater pumping under OSE File Nr. RG-960 totaled 65,444 acre-feet[3] (See Attachment B and Table 1, Row 21). ABCWUA also reported a combined net return flow of 56,947 acre-feet to the Rio Grande in 2012 (see Attachment A and Table 1, Row 22).[4] Of that amount, 15,524 acre-feet (Table 1, Row 23), is native Rio Grande water diverted and returned to the river as part of the DWP, for which return flow offset is not available.[5] Thus, ABCWUA return flow offsets totaled 41,423 acre-feet in 2012 (Table 1, Row 24).

Additional offsets available to ABCWUA for offset of OSE File No. RG-960 stream depletion effects include vested and acquired groundwater rights in the amount of 20,630

[3] See NMISC memorandum of June 10, 2013, from Doug Crosby to Gary Stansifer (Attachment B).
[4] Combined net return flow is total metered return flow less that amount of third-party return flow for which return flow credits are retained by such parties by contract (Intel Corporation, RG-57125 et al.; Sandia Peak Services, RG-12871; and Tierra West Mobile Home Park, RG-45307). ABCWUA return flow results from the combined exercise of RG-960, RG-4462 and SP-4830 as well as from the exercise by other third parties of groundwater permits for which return flow credits were not retained by such parties.
[5] See Condition of Approval No. 9 for SP-4830.

acre-feet (Table 1, Row 25)[6] and pre-1907 surface water rights in the amount of 4,380 acre-feet (Table 1, Row 26) for a total of 25,010 acre-feet.

ABCWUA and OSE have agreed to cap the over-release amount available for offset at 3,000 acre-feet per year, the permited amount for SP-4819. The balance of un-diverted DWP SJC water available for offset after offsetting releases for SP-4819 is 134 acre-feet (Table 1, lines 10 and 27) is applied here to RG-960.

Thus, total offsets available in 2012 equaled 66,567 acre-feet (Table 1, Row 28), which is greater than the 2012 stream depletions from RG-960 (65,444 acre-feet). This leaves a balance of 0 requiring offset for RG-960 for 2012 (Table 1, Row 29).

USR-2

No diversions were reported in 2012 under OSE File No. 4819 for recharge to the subsurface through the Bear Canyon Arroyo Aquifer Recharge Demonstration Project under OSE permit USR-2 (Table 1, Row 30). OSE has approved a recovery amount of 1,073 acre feet of water under permit USR-2 but no water was recovered in 2012 (Table 1, Row 30).

Summary

In summary, ABCWUA reported diverting 105,456 acre-feet of combined groundwater and surface water (both Rio Grande and San Juan-Chama water) in 2012 via exercise of OSE permits SP-4830, SP-4819, RG-960 and RG-4462.

- Operations under SP-4830 resulted in a credit of 3,000 acre-feet for offset of other ABCWUA permit operations (part of which applied herein against SP-4819).

- Operations under SP-4819, after inclusion of the 2,866 acre-feet of credit from operations under SP-4830, resulted in no additional offset requirement.

- Exercise under RG-960 resulted in stream depletions totaling 65,444 acre-feet versus total offset of 66,567 acre-feet, resulting in no additional offset requirement.

- Exercise under RG-4462 resulted in stream depletions totaling 4,148 acre-feet versus offset of 4,148 acre-feet, resulting in no additional offset requirement.

- No water was discharged to the subsurface or recovered under the exercise of USR-2.

[6] These are groundwater rights established prior to the declaration of the Rio Grande Underground Water Basin in 1956. Exercise of such rights does not require offset.

Conclusion

No release of ABCWUA SJC water is necessary for offset of stream depletion impacts resulting from exercise in 2012 of RG-960. Stream depletion impacts resulting from exercise of SP-4830, SP-4819, and RG-4462 in 2012 have been fully offset.

List of Attachments

Attachment A - ABCWUA Water Production Report for 2012
Attachment B – June 10, 2013 Memorandum from Doug Crosby, OSE District 1 Water Rights, to Nabil Shafike, ISC Hydrologist
Attachment C - RG-4462 Stream Depletion Glover-Balmer Modeling Output

Table 1			
2012 ABCWUA Comprehensive Permit Accounting			
Row	**Item**	**Amount (acre-feet)**	**Notes**
SP-4830 ACCOUNTING			
1	Total DWP Diversions	43,080	ABCWUA Daily Report Spreadsheet
2	SJC Water Diverted	27,556	ABCWUA Daily Report Spreadsheet
3	Rio Grande Water Diverted	15,524	Row 1 - Row 2; Assumes returned to river at Southside WWTP. Only SJC water diverted during part of July-August 2012
4	SJC DWP Diversions pursuant to approved exchange operations	0	
5	SJC DWP non-exchange Diversions	27,556	Equal to Row 2 - Row 4
6	SJC Releases from Abiquiu for DWP	33,349	2012 Final URGWOM Accounting
7	Conveyance Losses, Abiquiu to POD	1,661	Loss Accounting Spreadsheet (per permit condition #7)
8	SJC Over Releases	4,132	Equal to Row 6 - Row 7 - Row 5
8a	SJC Available for Offsets	3,000	Over release capped at 3,000 af
9	Undiverted SJC Releases Approved for Offset of SP-4819	2,866	Equal to Row 11 up to 3,000 AF
10	Balance of DWP SJC Releases availabel for other offsets	134	Equal to Row 8a - Row 9
SP-4819 ACCOUNTING			
11	Total 4819 Diversions	2,866	ABCWUA Monthly Production Report
12	Undiverted 4830 Releases Approved for Offset	2,866	Equal to Row 9
13	Balance Requiring Offset	0	
14	4819 Diversions Recharged via USR-2	0	
	RG-4462 ACCOUNTING		
15	Total RG-4462 Diversions	3,917	ABCWUA Monthly Production Report
16	2012 RG-4462 Stream Depletions	4,148	Glover-Balmer Method
17	Acquired Water Rights (not under leaseback)	1,261	
18	Total RG-4462 Return Flow	2,887	ABCWUA Monthly Production Report
19	Balance Requiring Offset	0	Equal to Row 16 - Row 17 -Row 18
RG-960 ACCOUNTING			
20	Total RG-960 Diversions	55,593	ABCWUA Monthly Production Report & Individual Well Report
21	2012 RG-960 Stream Depletions	65,444	Modeled depletions; OSE memo dated June 10, 2013
22	Metered net return flow	56,947	ABCWUA Monthly Production Report
23	4830 native Rio Grande diversions returned to river	15,524	Equal to Row 3; No return flow credit granted for this water
24	Return flow offset	41,423	Equal to Row 22 - Row 23
25	Vested and acquired pre-basin gw rights	20,630	ABCWUA Cumulative Consumptive Use Water Rights Report
26	Acquired pre-1907 surface water rights not under leaseback	4,380	ABCWUA Cumulative Consumptive Use Water Rights Report
27	Un-diverted DWP SJC releases not credited above	134	Equal to Row 10, if extenuating circumstances and approved by OSE.
28	Total offsets	66,567	Equal to Rows 24 + 25 + 26 + 27
29	Balance Requiring Offset	0	Equal to Row 21 - Row 28
USR-2 ACCOUNTING			
30	Total recharge to subsurface	0	Equal to Row 14
31	Amount of recharge approved for recovery	0	
Total Offset Required			
32	Total Offset Required	0	Equal to Row 29

Attachment - A

ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY
MONTHLY WATER PRODUCTION REPORT FOR 2012

WATER SYSTEM	RG NUMBER	Dec-12	Dec-12	2012 TOTALS	2012 TOTALS
WELL FIELDS		KGAL	ACRE-FEET	KGAL	ACRE-FEET
ATR - ATRISCO	RG-03202	3,717.0	11.41	**271,429.4**	**833.0**
BUR - BURTON	RG-03206	94,240.0	289.21	**1,412,900.9**	**4,336.0**
CHW - CHARLES WELLS	RG-15569	91,009.0	279.30	**2,213,110.5**	**6,791.8**
COL - COLLEGE	RG-30153	0.0	0.00	**2,138.5**	**6.6**
COR - CORONADO	RG-24057	66.0	0.20	**64,394.0**	**197.6**
DUR - DURANES	RG-03205	7,159.0	21.97	**1,190,876.6**	**3,654.7**
EUB - EUBANK/LOVE	RG-00960	26,902.0	82.56	**866,251.2**	**2,658.4**
GON - GONZALES	RG-50198	90,227.0	276.90	**1,717,566.5**	**5,271.0**
GRI - GRIEGOS	RG-03208	5,922.0	18.17	**434,182.8**	**1,332.5**
LDR - LEYENDECKER	RG-03586	36,613.0	112.36	**1,634,939.0**	**5,017.4**
LEA - LEAVITT	RG-23912	0.0	0.00	**4,097.7**	**12.6**
LOM - LOMAS	RG-06751	50,161.0	153.94	**607,864.2**	**1,865.5**
MRD - MILES ROAD	RG-23913	0.0	0.00	**0.0**	**0.0**
PON - PONDEROSA	RG-06752	0.0	0.00	**172,751.1**	**530.2**
RID - RIDGECREST	RG-09302	143,859.0	441.49	**1,695,870.5**	**5,204.4**
SBA - SANTA BARBARA	RG-09301	1,471.0	4.51	**162,970.3**	**500.1**
SJE - SAN JOSE	RG-03203	0.0	0.00	**0.0**	**0.0**
THS - THOMAS	RG-02501	30,596.0	93.90	**1,322,300.2**	**4,058.0**
VCL - VOLCANO CLIFFS	RG-15568	14,576.0	44.73	**561,859.4**	**1,724.3**
VLA - VOLANDIA	RG-04810	160,477.0	492.49	**2,458,872.1**	**7,546.0**
WAW - W.A. WEBSTER	RG-27198	0.0	0.00	**6,672.1**	**20.5**
WKR - WALKER	RG-33032	0.0	0.00	**4,950.0**	**15.2**
WSM - WEST MESA	RG-02196	0.0	0.00	**0.0**	**0.0**
YAL - YALE	RG-02198	1,215.0	3.73	**794,348.3**	**2,437.8**
ZAM - ZAMORA	RG-55230	1,356.0	4.16	**39,544.0**	**121.4**
NWSA	RG-4462	21,607.0	66.31	**1,276,427.0**	**3,917.2**
SYSTEM TOTAL GW		**781,173.0**	**2,397.3**	**18,916,316.4**	**58,052.0**
SYSTEM TOTAL DWP		**953,128.0**	**2,925.0**	**14,079,608.3**	**43,208.7**
TOTAL SYSTEM		**1,734,301.0**	**5,322.4**	**32,995,924.7**	**101,260.8**
NON-SYSTEM WELLS					
MDC WELL	RG-74165	2,883.00	8.85	**36,959.6**	**113.4**
LOVE WELL #2	RG-00960-S	3,246.90	9.96	**193,584.2**	**594.1**
LADERA WELL	RG-30153	2,059.00	6.32	**180,964.0**	**555.4**
MESA DEL SOL (1)	RG-606 (B)	0.00	0.00	**22,886.0**	**70.2**
CERRO COLORADO	RG-51859	422.50	1.30	**21,822.6**	**67.0**
OPEN SPACE WELL	RG-29597	99.00	0.30	**3,691.0**	**11.3**
ALTAMONT FIELD	RG-46861	8.45	0.03	**11,122.5**	**34.1**
BCIP Well #1	RG-85442	1,067.00	3.27	**18,702.6**	**57.4**
BCIP Well #2	RG-57917	0.00	0.00	**0.0**	**0.0**
SOIL AMENDMENT	RG-48351	9.50	0.03	**630.6**	**1.9**
DOUBLE EAGLE	RG-35511	0.00	0.00	**0.0**	**0.0**
NON-SYSTEM TOTAL		**9,795.3**	**30.1**	**490,363.1**	**1,504.9**
AREA-WIDE TOTAL GW		790,968.4	2,427.4	**19,406,679.4**	**59,556.9**
Total System and Nonsystem		1,744,096.4	5,352.4	33,486,287.7	102,765.6
RETURN FLOW (RF)		MGAL	ACRE-FEET	MGAL	ACRE-FEET
TOTAL SWRP DISCHARGE		1,508.53	4,629.51	**20,472.5**	**62,827.8**
RG-960 & SP-4830 RF			**4,346.00**		**57,447.7**
RG-4462 RF			**60.90**		**2,386.1**
ABCWUA TOTAL RF			**4,406.90**		**59,833.8**
NPSWRP PERMIT SP 4819		15.50	47.56	**933.9**	**2,865.9**
ASR PERMIT NO. DP-26		0.00	0.00	**0.0**	**0.0**
(1) Mesa Del Sol meter replaced June 2012. Usage estimated for that month.					

Attachment - B

NEW MEXICO INTERSTATE STREAM COMMISSION

MEMORANDUM

June 10, 2013

TO: Gary Stansifer, OSE Middle Rio Grande Water Master

FROM: Doug Crosby, OSE

Through: Nabil Shafike, ISC

SUBJECT: Albuquerque Bernalillo County Water Utility Authority (ABCWUA) Pumping Impact for Calendar Year 2012 (OSE File No. RG-960)

The Middle Rio Grande Administrative Area Model (2000) was used to simulate the impact of ABCWUA well withdrawals during the calendar year 2012. Model results for two model runs, one with the ABCWUA pumping and the other without the ABCWUA pumping were used to estimate the impact on the surface water of the middle valley including the Rio Grande, Rio Jemez and drains. During 2012 ABCWUA reported a total withdrawal of 55,592 af and the resulting impact on the surface water was estimated to be 65,444 af.

Model Set-up

The model is set up to run a steady-state stress period, followed by transient stress periods, which run the model through 2012. From 1994 onward, the simulated stress period is 1 year, with 10 uniform time steps (36.5 days).

Two simulations were completed for the analysis: 1) a baseline run using a version of the well file that does not include any ABCWUA wells; and 2) a run that uses the well file includes all reported ABCWUA well withdrawals through 2012. No other changes to the model were made, thus isolating the changes resulting from ABCWUA well withdrawals. The MODFLOW file manipulated was the well file. This file was updated to include the diversion rates for the ABCWUA wells for the year 2012. Well files were updated using diversion data provided by the ABCWUA (Andrew Lieuwen, via e-mail) monthly reports and annual summary of diversions for Water System and Non-Water System wells submitted to the OSE Water Rights Division (WRD). These reports include wastewater returns to the Rio Grande.

Post-Processing

The river depletions were determined by comparing the water budgets from the two simulations. This comparison was completed using the "MASSUMLL.EXE" code created by P. Barroll. The code separates out the effects of pumping on the Rio Grande, drains and the Rio Jemez.

Simulated results

Table below illustrates total withdrawals, reported return flow and computed stream depletions for the period from 2000 to 2012. The results indicate that the annual stream depletions for 2012 were 65,444.10 af. This value represents a decrease of about 0.37 percent over 2011 stream depletions. It should be noted that during 2012 ABCWUA reduced its groundwater withdrawals by approximately 2.7 percent compared to its 2011 withdrawals.

YEAR	TOTAL ANNUAL WELL DIVERSIONS (AFY)	TOTAL ANNUAL STREAM DEPLETION (AFY)
2000	115,079.50	71,797.10
2001	110,957.60	72,946.40
2002	107,894.10	73,878.30
2003	108,016.10	74,250.70
2004	101,538.40	72,920.60
2005	102,543.70	74,600.60
2006	99,806.50	74,735.30
2007	98,560.10	74,598.60
2008	101,312.50	73,711.60
2009	78,848.20	71,062.90
2010	59,478.30	67,755.20
2011	57,152.40	65,686.20
2012	55,592.65	65,444.10

References

Barroll, P., 2001. Documentation of the Administrative Groundwater Model for the Middle Rio Grande Basin. Office of the State Engineer Technical Services Unit Hydrology Bureau Report 99-3.

Attachment - C

RG-4462 et al. (Formerly NMUI)

STREAM DEPLETION CAUSED BY PUMPING MULTIPLE WELLS AT VARIOUS RATES IN AN INFINITE - STRIP, NON - LEAKY AQUIFER. THE WELLS ARE BETWEEN THE STREAM AND A PLANE BOUNDARY.

(Glover and Balmer equation)

T = 13368. square ft/day S = .200000

Number of wells = 9

Distance from stream to plane boundary = 13.50 miles

Distances of the wells from the stream and the number of pumping rates

Well #	Distance (miles)	No. of rates
1	4.50	54
2	5.10	54
3	4.10	54
4	5.00	20
5	4.20	17
6	1.00	1
7	5.90	12
8	2.40	9
9	4.20	9

PUMPING SCHEDULES FOR THE WELLS

Pumping schedule for well number 1

	Pumping rate			Pumping time	
Q(1) =	184.0	ac-ft/yr	for	1.000	years
Q(2) =	1038.0	ac-ft/yr	for	1.000	years
Q(3) =	919.0	ac-ft/yr	for	1.000	years
Q(4) =	915.0	ac-ft/yr	for	1.000	years
Q(5) =	850.0	ac-ft/yr	for	1.000	years
Q(6) =	465.0	ac-ft/yr	for	1.000	years
Q(7) =	259.0	ac-ft/yr	for	1.000	years
Q(8) =	326.0	ac-ft/yr	for	1.000	years

Q(9)	=	227.0	ac-ft/yr	for	1.000	years
Q(10)	=	227.0	ac-ft/yr	for	1.000	years
Q(11)	=	348.0	ac-ft/yr	for	1.000	years
Q(12)	=	468.0	ac-ft/yr	for	1.000	years
Q(13)	=	500.0	ac-ft/yr	for	1.000	years
Q(14)	=	443.0	ac-ft/yr	for	1.000	years
Q(15)	=	755.0	ac-ft/yr	for	1.000	years
Q(16)	=	736.0	ac-ft/yr	for	1.000	years
Q(17)	=	982.0	ac-ft/yr	for	1.000	years
Q(18)	=	710.0	ac-ft/yr	for	1.000	years
Q(19)	=	795.0	ac-ft/yr	for	1.000	years
Q(20)	=	587.0	ac-ft/yr	for	1.000	years
Q(21)	=	902.0	ac-ft/yr	for	1.000	years
Q(22)	=	527.0	ac-ft/yr	for	1.000	years
Q(23)	=	231.0	ac-ft/yr	for	1.000	years
Q(24)	=	225.0	ac-ft/yr	for	1.000	years
Q(25)	=	321.0	ac-ft/yr	for	1.000	years
Q(26)	=	322.0	ac-ft/yr	for	1.000	years
Q(27)	=	340.0	ac-ft/yr	for	1.000	years
Q(28)	=	1490.0	ac-ft/yr	for	1.000	years
Q(29)	=	1391.0	ac-ft/yr	for	1.000	years
Q(30)	=	1688.0	ac-ft/yr	for	1.000	years
Q(31)	=	1391.0	ac-ft/yr	for	1.000	years
Q(32)	=	1294.0	ac-ft/yr	for	1.000	years
Q(33)	=	1040.0	ac-ft/yr	for	1.000	years
Q(34)	=	1131.0	ac-ft/yr	for	1.000	years
Q(35)	=	1196.0	ac-ft/yr	for	1.000	years
Q(36)	=	1880.0	ac-ft/yr	for	1.000	years
Q(37)	=	1146.0	ac-ft/yr	for	1.000	years
Q(38)	=	657.0	ac-ft/yr	for	1.000	years
Q(39)	=	991.0	ac-ft/yr	for	1.000	years
Q(40)	=	975.0	ac-ft/yr	for	1.000	years
Q(41)	=	1677.0	ac-ft/yr	for	1.000	years
Q(42)	=	1485.0	ac-ft/yr	for	1.000	years
Q(43)	=	1617.0	ac-ft/yr	for	1.000	years
Q(44)	=	631.0	ac-ft/yr	for	1.000	years
Q(45)	=	1567.0	ac-ft/yr	for	1.000	years
Q(46)	=	1933.0	ac-ft/yr	for	1.000	years
Q(47)	=	1885.0	ac-ft/yr	for	1.000	years
Q(48)	=	2313.0	ac-ft/yr	for	1.000	years
Q(49)	=	2702.0	ac-ft/yr	for	1.000	years
Q(50)	=	3889.0	ac-ft/yr	for	1.000	years
Q(51)	=	1148.0	ac-ft/yr	for	1.000	years
Q(52)	=	1801.0	ac-ft/yr	for	1.000	years
Q(53)	=	672.0	ac-ft/yr	for	1.000	years
Q(54)	=	672.0	ac-ft/yr	for	28.000	years

Pumping schedule for well number 2

		Pumping rate			Pumping time	
Q(1)	=	.0	ac-ft/yr	for	1.000	years
Q(2)	=	.0	ac-ft/yr	for	1.000	years
Q(3)	=	.0	ac-ft/yr	for	1.000	years
Q(4)	=	.0	ac-ft/yr	for	1.000	years
Q(5)	=	.0	ac-ft/yr	for	1.000	years
Q(6)	=	449.0	ac-ft/yr	for	1.000	years
Q(7)	=	732.0	ac-ft/yr	for	1.000	years
Q(8)	=	642.0	ac-ft/yr	for	1.000	years
Q(9)	=	767.0	ac-ft/yr	for	1.000	years

Q(10) =	749.0	ac-ft/yr	for	1.000	years
Q(11) =	711.0	ac-ft/yr	for	1.000	years
Q(12) =	648.0	ac-ft/yr	for	1.000	years
Q(13) =	725.0	ac-ft/yr	for	1.000	years
Q(14) =	761.0	ac-ft/yr	for	1.000	years
Q(15) =	718.0	ac-ft/yr	for	1.000	years
Q(16) =	727.0	ac-ft/yr	for	1.000	years
Q(17) =	717.0	ac-ft/yr	for	1.000	years
Q(18) =	1054.0	ac-ft/yr	for	1.000	years
Q(19) =	1177.0	ac-ft/yr	for	1.000	years
Q(20) =	1222.0	ac-ft/yr	for	1.000	years
Q(21) =	1031.0	ac-ft/yr	for	1.000	years
Q(22) =	1207.0	ac-ft/yr	for	1.000	years
Q(23) =	213.0	ac-ft/yr	for	1.000	years
Q(24) =	472.0	ac-ft/yr	for	1.000	years
Q(25) =	537.0	ac-ft/yr	for	1.000	years
Q(26) =	353.0	ac-ft/yr	for	1.000	years
Q(27) =	308.0	ac-ft/yr	for	1.000	years
Q(28) =	123.0	ac-ft/yr	for	1.000	years
Q(29) =	8.0	ac-ft/yr	for	1.000	years
Q(30) =	108.0	ac-ft/yr	for	1.000	years
Q(31) =	159.0	ac-ft/yr	for	1.000	years
Q(32) =	155.0	ac-ft/yr	for	1.000	years
Q(33) =	136.0	ac-ft/yr	for	1.000	years
Q(34) =	709.0	ac-ft/yr	for	1.000	years
Q(35) =	1247.0	ac-ft/yr	for	1.000	years
Q(36) =	1145.0	ac-ft/yr	for	1.000	years
Q(37) =	1007.0	ac-ft/yr	for	1.000	years
Q(38) =	1270.0	ac-ft/yr	for	1.000	years
Q(39) =	1282.0	ac-ft/yr	for	1.000	years
Q(40) =	835.0	ac-ft/yr	for	1.000	years
Q(41) =	982.0	ac-ft/yr	for	1.000	years
Q(42) =	768.0	ac-ft/yr	for	1.000	years
Q(43) =	684.0	ac-ft/yr	for	1.000	years
Q(44) =	981.0	ac-ft/yr	for	1.000	years
Q(45) =	495.0	ac-ft/yr	for	1.000	years
Q(46) =	608.0	ac-ft/yr	for	1.000	years
Q(47) =	.0	ac-ft/yr	for	1.000	years
Q(48) =	1318.0	ac-ft/yr	for	1.000	years
Q(49) =	999.0	ac-ft/yr	for	1.000	years
Q(50) =	.0	ac-ft/yr	for	1.000	years
Q(51) =	.0	ac-ft/yr	for	1.000	years
Q(52) =	.8	ac-ft/yr	for	1.000	years
Q(53) =	5.1	ac-ft/yr	for	1.000	years
Q(54) =	5.1	ac-ft/yr	for	28.000	years

Pumping schedule for well number 3

	Pumping rate			Pumping time	
Q(1) =	.0	ac-ft/yr	for	1.000	years
Q(2) =	.0	ac-ft/yr	for	1.000	years
Q(3) =	.0	ac-ft/yr	for	1.000	years
Q(4) =	.0	ac-ft/yr	for	1.000	years
Q(5) =	.0	ac-ft/yr	for	1.000	years
Q(6) =	.0	ac-ft/yr	for	1.000	years
Q(7) =	.0	ac-ft/yr	for	1.000	years
Q(8) =	.0	ac-ft/yr	for	1.000	years
Q(9) =	.0	ac-ft/yr	for	1.000	years
Q(10) =	.0	ac-ft/yr	for	1.000	years

Q(11) =	.0	ac-ft/yr	for	1.000	years
Q(12) =	.0	ac-ft/yr	for	1.000	years
Q(13) =	.0	ac-ft/yr	for	1.000	years
Q(14) =	.0	ac-ft/yr	for	1.000	years
Q(15) =	.0	ac-ft/yr	for	1.000	years
Q(16) =	.0	ac-ft/yr	for	1.000	years
Q(17) =	.0	ac-ft/yr	for	1.000	years
Q(18) =	.0	ac-ft/yr	for	1.000	years
Q(19) =	.0	ac-ft/yr	for	1.000	years
Q(20) =	.0	ac-ft/yr	for	1.000	years
Q(21) =	.0	ac-ft/yr	for	1.000	years
Q(22) =	116.0	ac-ft/yr	for	1.000	years
Q(23) =	1205.0	ac-ft/yr	for	1.000	years
Q(24) =	1020.0	ac-ft/yr	for	1.000	years
Q(25) =	952.0	ac-ft/yr	for	1.000	years
Q(26) =	1115.0	ac-ft/yr	for	1.000	years
Q(27) =	1357.0	ac-ft/yr	for	1.000	years
Q(28) =	713.0	ac-ft/yr	for	1.000	years
Q(29) =	1105.0	ac-ft/yr	for	1.000	years
Q(30) =	1150.0	ac-ft/yr	for	1.000	years
Q(31) =	1225.0	ac-ft/yr	for	1.000	years
Q(32) =	1139.0	ac-ft/yr	for	1.000	years
Q(33) =	1770.0	ac-ft/yr	for	1.000	years
Q(34) =	1340.0	ac-ft/yr	for	1.000	years
Q(35) =	1142.0	ac-ft/yr	for	1.000	years
Q(36) =	1079.0	ac-ft/yr	for	1.000	years
Q(37) =	1198.0	ac-ft/yr	for	1.000	years
Q(38) =	1564.0	ac-ft/yr	for	1.000	years
Q(39) =	1633.0	ac-ft/yr	for	1.000	years
Q(40) =	1077.0	ac-ft/yr	for	1.000	years
Q(41) =	1175.0	ac-ft/yr	for	1.000	years
Q(42) =	1758.0	ac-ft/yr	for	1.000	years
Q(43) =	1580.0	ac-ft/yr	for	1.000	years
Q(44) =	1871.0	ac-ft/yr	for	1.000	years
Q(45) =	2284.0	ac-ft/yr	for	1.000	years
Q(46) =	1777.0	ac-ft/yr	for	1.000	years
Q(47) =	1596.0	ac-ft/yr	for	1.000	years
Q(48) =	550.0	ac-ft/yr	for	1.000	years
Q(49) =	15.0	ac-ft/yr	for	1.000	years
Q(50) =	.0	ac-ft/yr	for	1.000	years
Q(51) =	.0	ac-ft/yr	for	1.000	years
Q(52) =	.0	ac-ft/yr	for	1.000	years
Q(53) =	.0	ac-ft/yr	for	1.000	years
Q(54) =	.0	ac-ft/yr	for	28.000	years

Pumping schedule for well number 4

	Pumping rate			Pumping time	
Q(1) =	.0	ac-ft/yr	for	36.000	years
Q(2) =	232.0	ac-ft/yr	for	1.000	years
Q(3) =	1604.0	ac-ft/yr	for	1.000	years
Q(4) =	1238.0	ac-ft/yr	for	1.000	years
Q(5) =	1175.0	ac-ft/yr	for	1.000	years
Q(6) =	547.0	ac-ft/yr	for	1.000	years
Q(7) =	1129.0	ac-ft/yr	for	1.000	years
Q(8) =	1684.0	ac-ft/yr	for	1.000	years
Q(9) =	2265.0	ac-ft/yr	for	1.000	years
Q(10) =	1768.0	ac-ft/yr	for	1.000	years
Q(11) =	1418.0	ac-ft/yr	for	1.000	years

Q(12) =	1801.0	ac-ft/yr	for	1.000	years
Q(13) =	2044.0	ac-ft/yr	for	1.000	years
Q(14) =	1839.0	ac-ft/yr	for	1.000	years
Q(15) =	1693.0	ac-ft/yr	for	1.000	years
Q(16) =	176.0	ac-ft/yr	for	1.000	years
Q(17) =	6.2	ac-ft/yr	for	1.000	years
Q(18) =	17.1	ac-ft/yr	for	1.000	years
Q(19) =	114.2	ac-ft/yr	for	1.000	years
Q(20) =	114.2	ac-ft/yr	for	28.000	years

Pumping schedule for well number 5

	Pumping rate			Pumping time	
Q(1) =	.0	ac-ft/yr	for	38.000	years
Q(2) =	460.0	ac-ft/yr	for	1.000	years
Q(3) =	1470.0	ac-ft/yr	for	1.000	years
Q(4) =	1698.0	ac-ft/yr	for	1.000	years
Q(5) =	1301.0	ac-ft/yr	for	1.000	years
Q(6) =	1025.0	ac-ft/yr	for	1.000	years
Q(7) =	1728.0	ac-ft/yr	for	1.000	years
Q(8) =	1315.0	ac-ft/yr	for	1.000	years
Q(9) =	1525.0	ac-ft/yr	for	1.000	years
Q(10) =	1897.0	ac-ft/yr	for	1.000	years
Q(11) =	1846.0	ac-ft/yr	for	1.000	years
Q(12) =	1704.0	ac-ft/yr	for	1.000	years
Q(13) =	419.0	ac-ft/yr	for	1.000	years
Q(14) =	1049.0	ac-ft/yr	for	1.000	years
Q(15) =	.5	ac-ft/yr	for	1.000	years
Q(16) =	.1	ac-ft/yr	for	1.000	years
Q(17) =	.1	ac-ft/yr	for	28.000	years

Pumping schedule for well number 6

	Pumping rate			Pumping time	
Q(1) =	.0	ac-ft/yr	for	81.000	years

Pumping schedule for well number 7

	Pumping rate			Pumping time	
Q(1) =	.0	ac-ft/yr	for	43.000	years
Q(2) =	582.0	ac-ft/yr	for	1.000	years
Q(3) =	771.0	ac-ft/yr	for	1.000	years
Q(4) =	723.0	ac-ft/yr	for	1.000	years
Q(5) =	894.0	ac-ft/yr	for	1.000	years
Q(6) =	342.0	ac-ft/yr	for	1.000	years
Q(7) =	228.0	ac-ft/yr	for	1.000	years
Q(8) =	372.0	ac-ft/yr	for	1.000	years
Q(9) =	16.0	ac-ft/yr	for	1.000	years
Q(10) =	546.1	ac-ft/yr	for	1.000	years
Q(11) =	473.4	ac-ft/yr	for	1.000	years
Q(12) =	473.4	ac-ft/yr	for	28.000	years

Pumping schedule for well number 8

	Pumping rate			Pumping time	
Q(1) =	.0	ac-ft/yr	for	46.000	years
Q(2) =	41.0	ac-ft/yr	for	1.000	years
Q(3) =	75.0	ac-ft/yr	for	1.000	years
Q(4) =	2040.0	ac-ft/yr	for	1.000	years
Q(5) =	2591.0	ac-ft/yr	for	1.000	years
Q(6) =	3044.0	ac-ft/yr	for	1.000	years
Q(7) =	2194.0	ac-ft/yr	for	1.000	years
Q(8) =	2123.7	ac-ft/yr	for	1.000	years
Q(9) =	2123.7	ac-ft/yr	for	28.000	years

Pumping schedule for well number 9

	Pumping rate			Pumping time	
Q(1) =	.0	ac-ft/yr	for	46.000	years
Q(2) =	499.0	ac-ft/yr	for	1.000	years
Q(3) =	810.0	ac-ft/yr	for	1.000	years
Q(4) =	.0	ac-ft/yr	for	1.000	years
Q(5) =	.0	ac-ft/yr	for	1.000	years
Q(6) =	45.0	ac-ft/yr	for	1.000	years
Q(7) =	461.0	ac-ft/yr	for	1.000	years
Q(8) =	528.3	ac-ft/yr	for	1.000	years
Q(9) =	528.3	ac-ft/yr	for	28.000	years

Image Control = .10000000E-04

Time variable (t)

t min = 1.000 years; t max = 81.000 years;
delta t = 1.000 years

Time Period (years)	Rate of Depletion (ac-ft/yr)	Accumulated Depletion Volume (acre-feet)	Depletion Volume in Time (acre-feet)
1.000	.123851	.015542	.015542
2.000	3.555618	1.282739	1.267197
3.000	22.885954	12.703033	11.420294
4.000	56.845471	51.972304	39.269271
5.000	93.694416	127.273217	75.300913
6.000	127.920235	238.480723	111.207506
7.000	155.237859	380.669445	142.188722
8.000	177.073436	547.083132	166.413687
9.000	198.011848	734.608818	187.525686
10.000	218.398899	942.891533	208.282715
11.000	238.145169	1171.186703	228.295170
12.000	258.849502	1419.523729	248.337026

13.000	281.846793	1689.687974	270.164246
14.000	306.621193	1983.810583	294.122609
15.000	331.745631	2302.989521	319.178938
16.000	360.109202	2648.466996	345.477475
17.000	392.101084	3024.400978	375.933982
18.000	427.483127	3433.871837	409.470859
19.000	463.677566	3879.531224	445.659387
20.000	500.781746	4361.579604	482.048380
21.000	537.449064	4880.883596	519.303992
22.000	574.540846	5436.702659	555.819063
23.000	612.572037	6029.932673	593.230014
24.000	662.715978	6666.876784	636.944111
25.000	708.671242	7353.500366	686.623582
26.000	745.555230	8081.075964	727.575597
27.000	780.680792	8844.137065	763.061101
28.000	818.395365	9643.567493	799.430429
29.000	857.265882	10480.912168	837.344674
30.000	906.998723	11362.096772	881.184605
31.000	967.106937	12298.412307	936.315535
32.000	1029.702864	13297.155417	998.743110
33.000	1085.007895	14355.011036	1057.855618
34.000	1142.431617	15468.487981	1113.476946
35.000	1195.234954	16637.918317	1169.430335
36.000	1245.037988	17857.785578	1219.867262
37.000	1306.430287	19132.199610	1274.414031
38.000	1373.708962	20472.449850	1340.250240
39.000	1448.801714	21881.988623	1409.538773
40.000	1553.979952	23380.734135	1498.745512
41.000	1683.047519	24997.900513	1617.166378
42.000	1828.965587	26752.630690	1754.730177
43.000	1983.536535	28658.882414	1906.251723
44.000	2130.986756	30716.691176	2057.808762
45.000	2284.624031	32923.214021	2206.522845
46.000	2455.363223	35292.191726	2368.977705
47.000	2629.966859	37834.588689	2542.396963
48.000	2811.176373	40554.699731	2720.111043
49.000	3122.269677	43492.861026	2938.161295
50.000	3555.717831	46832.545264	3339.684237
51.000	3934.728268	50581.786692	3749.241428
52.000	4140.596372	54645.929253	4064.142561
53.000	4148.420833	58798.610427	4152.681175
CALENDAR YEAR 2012			
54.000	4090.516284	62921.672231	4123.061804
55.000	4006.038853	66970.910084	4049.237853

56.000	3918.582301	70932.928357	3962.018273
57.000	3837.409560	74810.232513	3877.304156
58.000	3765.119554	78610.728937	3800.496424
59.000	3701.879127	82343.495308	3732.766372
60.000	3647.011164	86017.284005	3673.788697
61.000	3599.600017	89640.006794	3622.722789
62.000	3558.724196	93218.659809	3578.653015
63.000	3523.540331	96759.350594	3540.690785
64.000	3493.306598	100267.396515	3508.045922
65.000	3467.381723	103747.402584	3480.006069
66.000	3445.215294	107203.411825	3456.009241
67.000	3426.335361	110638.929879	3435.518054
68.000	3410.336702	114057.043506	3418.113628
69.000	3396.870181	117460.449931	3403.406425
70.000	3385.633843	120851.530511	3391.080580
71.000	3376.365392	124232.373198	3380.842686
72.000	3368.836113	127604.839430	3372.466232
73.000	3362.845661	130970.555657	3365.716228
74.000	3358.218078	134330.976902	3360.421244
75.000	3354.798253	137687.394425	3356.417523
76.000	3352.449046	141040.942295	3353.547871
77.000	3351.048956	144392.625839	3351.683544
78.000	3350.490098	147743.333953	3350.708114
79.000	3350.676505	151093.850655	3350.516701
80.000	3351.522761	154444.887935	3351.037280
81.000	3352.952730	157797.088244	3352.200309